Employment and Community

2000

Reintegrating the Workplace Into Mixed-Use Centers

New Jersey Office of State Planning

Opportunities for development are changing in New Jersey.

The forces driving this change include:

- The desire to revitalize our cities and towns;
- The growing public aversion towards sprawl and traffic congestion;
- The overwhelming public desire to preserve open space and farmland;
- The need to protect the quality of our air and water; and
- A growing demand for more livable communities.

Against this backdrop, many are rethinking the concept of the suburban office park, which is an integral part of sprawl.

Sprawl is low-density, single-use, auto-dependent development. It consumes a finite resource — land — at an alarming rate. It forces people into cars and chokes our roads with traffic.

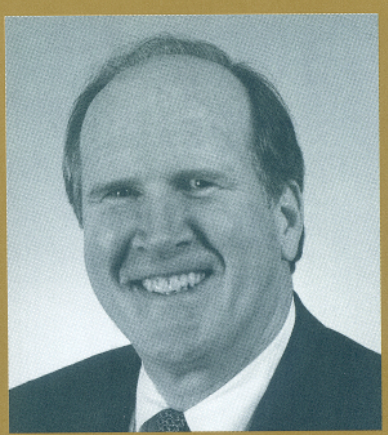
We are fortunate to have in the *State Development and Redevelopment Plan* a blueprint for smart growth in the Garden State. The State Plan provides guidance on where to locate new development, where to focus redevelopment, and where to preserve our open lands and farms. The State Plan advocates compact centers — a powerful antidote to sprawl. Centers are mixed-use communities where the work place is closely integrated with residences, recreation, civic spaces and all the other uses that make a community whole.

This publication focuses on the office work place — the fastest-growing sector of our service economy — and its links to the overall community. It suggests models for our new employment centers. It shows how office buildings, research laboratories and other contemporary work places can be successfully combined with restaurants, hotels, retail establishments, parking, housing and many other uses to create compact, mixed-use places that promote walking, facilitate transit and encourage human interaction.

We hope it will inspire business leaders, municipal officials, and others to demand and promote more livable communities, where the work place is an integral part of the whole.

Jane M. Kenny, Commissioner, New Jersey Department of Community Affairs

Jane Kenny



Charles E. (Sandy) Hance, Chief Executive Officer and Secretary, New Jersey Commerce and Economic Growth Commission

Sandy Hance

C O N T E N T S

A C K N O W L E D G E M E N T S

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INTRODUCTION

The suburban office campus may contain architecturally striking buildings and well-landscaped grounds, yet its auto dependency and isolation from other community uses make it a key contributor to sprawl.

In New Jersey, the prevailing development paradigm of the last 50 years has been characterized by sprawl — low-density, single-use, auto-dependent development on suburban or exurban greenfield sites. Residential, retail, manufacturing and warehousing followed this pattern. And large corporate office facilities, with the exception of the Hudson River waterfront and a few urban centers in other parts of the state, have overwhelmingly chosen to locate in office parks on suburban and exurban greenfield sites. This report will focus on the office workplace — the fastest-growing sector of our service economy — and explore its links to the overall community.

The suburban office park, or "campus," is an auto-dependent, low-density, single-use environment, carefully isolated from all the other land uses that make a balanced community. Whether it hosts a single, large corporation or a variety of smaller users, the suburban office park plays a key role in promoting sprawl, and specifically service sector employment sprawl — the relentless, auto-dependent decentralization of the office workplace.

The high societal costs of sprawl and the negative impacts associated with it are increasingly understood. There is convincing evidence that sprawl can seriously undermine a region's competitiveness and quality of life. Broad-based initiatives to curb further sprawl and retrofit existing sprawl are being developed at many levels of government and civic institutions. However, efforts to counter sprawl must confront the continued fixation with single-use development models, including the suburban office park or campus model.

The systematic physical separation of workplace from the surrounding community can be traced back to the late 1930's when development practices first rejected the mixed-use character of our traditional towns and cities and began to place an increased emphasis on the separation of *all* land uses. Enforcement of strict zoning requirements ensured the separation of land uses in new development. While single-use zoning was embraced as the way to minimize the conflicts that can occur when there is a clash between the different functional requirements of individual land uses (office, retail, manufacturing, housing, etc.), the considerable benefits of mixed use were forgotten. Single-use zoning has become deeply enshrined in municipal development regulations. Mixed-use development — and, by extension, a work place which is accessible to and integrated with the rest of the community — is currently forbidden in most New Jersey communities. And yet most service-sector employment activities are relatively benign, limited-impact land uses. If sensitively sited and designed, they can easily be integrated into the fabric of the community with multiple advantages and few, if any, disadvantages.

Background Photo: The generic suburban office park developed for the speculative market provides individual buildings ranging from 100,000 square feet to 400,000 square feet surrounded by parking and with proximity to an interstate highway. Few if any amenities or complementary uses are provided as part of this package.

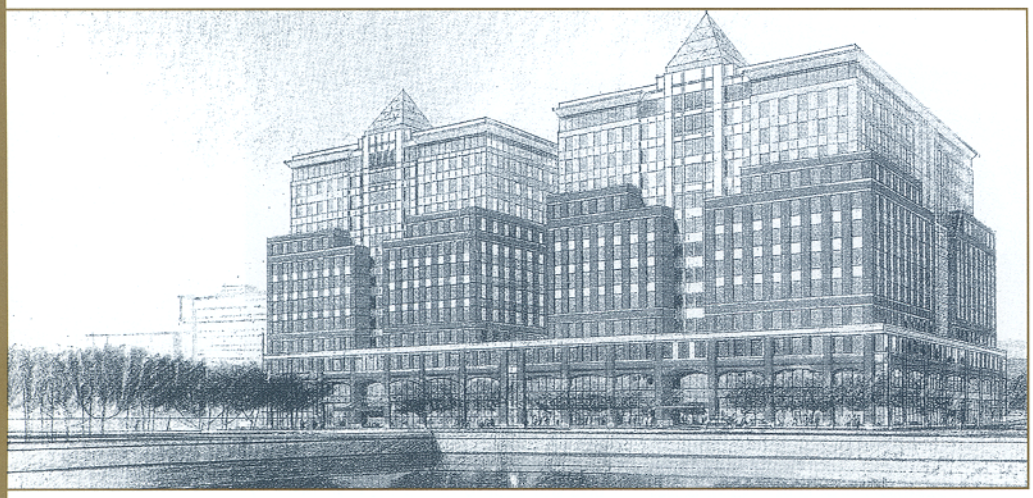
At Merck's 1,050-acre corporate campus in rural Whitehouse, Hunterdon County, the 2,000 employees have access to cafeteria, child care, health and fitness facilities (including a gym, jogging trails, basketball courts and athletic fields), medical services, convenience store, dry cleaning, banking, travel services, auto inspection and repair, bakery, take-out food, shoe repair and video rental. The campus is gated and not accessible to the public.

Drawing on the "park-like setting" of the traditional college campus for its imagery, the corporate workplace of the late 20th century has evolved into a seductive but increasingly insular environment. Upscale office parks offer large chunks of class A floor space, ample parking, convenient access to the highway network, controlled surroundings and an abundance of passive open space, often containing features such as wetlands, artificial ponds, fountains, ornamental farmland and underutilized recreational trails. These features offer privacy, by buffering the work place. But they also constitute effective physical barriers, isolating the work place from the surrounding community. Many of the workforce's ancillary retail and service needs, such as cafeteria, health club, hair salon, and travel agent, are provided through corporate subsidies within the campus. As a result, the workforce drives to the complex in the morning and departs in the evening without ever setting foot within the broader community or otherwise interacting with it in any meaningful way.

Smaller, stand-alone office buildings also with a highway or arterial orientation offer smaller amounts of floor space in less prestigious settings. With few amenities and little control over their immediate surroundings, stand alone ("single-family") office buildings can be found next to the gas station, the strip mall or the car wash. Lacking the subsidized services provided by corporate largesse in larger and more prestigious office parks, the car-bound work force is driven to patronize local businesses on the retail strip. These are often within walking distance but, for all practical purposes, are inaccessible to pedestrians. The result is a lunch-hour peak of extremely short car trips leading to further congestion on our major arterials.

The experience with new office development along the Hudson River waterfront and in selected urban centers suggests that the contemporary requirements of large office buildings is being met at these sites within the physical framework of traditional streets and blocks. This same experience suggests that the value of these locations for office employment is substantially enhanced by their access to public transit. Pragmatic office developers are currently building both within the traditional framework of streets and blocks, in selected urban and other compact locations, as well as in office park formats with isolated buildings on the suburban fringe.

The "single-family" office building with highway orientation provides neither the conveniences of a central, mixed-use location nor the amenities found in the more upscale office parks. The workforce must contend with poorly designed and visually chaotic surroundings and struggle with heavy traffic and poor accessibility. The poor quality of the surrounding environment is reflected in lower rents and lower work force satisfaction.



Large office buildings (over 1 million square feet) are planned for the Hoboken waterfront. The adopted redevelopment plan for these former industrial lands fits buildings with large footprints into Hoboken's 200 by 400-foot grid which is extended to the Hudson River.

How well is the suburban, auto-dependent model really performing for its developers, occupants, neighbors, and host communities? Is it an appropriate model to carry into the new millennium? The considerable direct and indirect, short-term and long-term costs of sprawl development cast serious doubts on its long term viability. Shouldn't the industry and the state be promoting alternatives such as the compact, mixed-use models envisioned by the *New Jersey State Development and Redevelopment Plan*? The State Plan advocates the "Centers" concept — a mixed-use environment where the office work place is closely linked to residential, retail and services, civic, recreational and all the other activities that create a full-service community. Are there physical or functional constraints preventing this from taking place?

To address these questions, this report will:

- Examine how generic suburban building blocks (conventional office building, parking deck, retail store, etc.) can be reassembled into a framework of streets and blocks designed to provide compact walking conditions and a mixed-use environment;
- Showcase current trends in the development industry through a number of high-visibility projects which have chosen to integrate large-scale office employment into a mixed-use environment in unprecedented ways; and
- Identify opportunities for state government to encourage new mixed-use centers where employment is truly a part of the community.

SQUARE FEET OF OFFICE SPACE AUTHORIZED BY BUILDING PERMIT
TOP 20 NJ MUNICIPALITIES 1995-1999

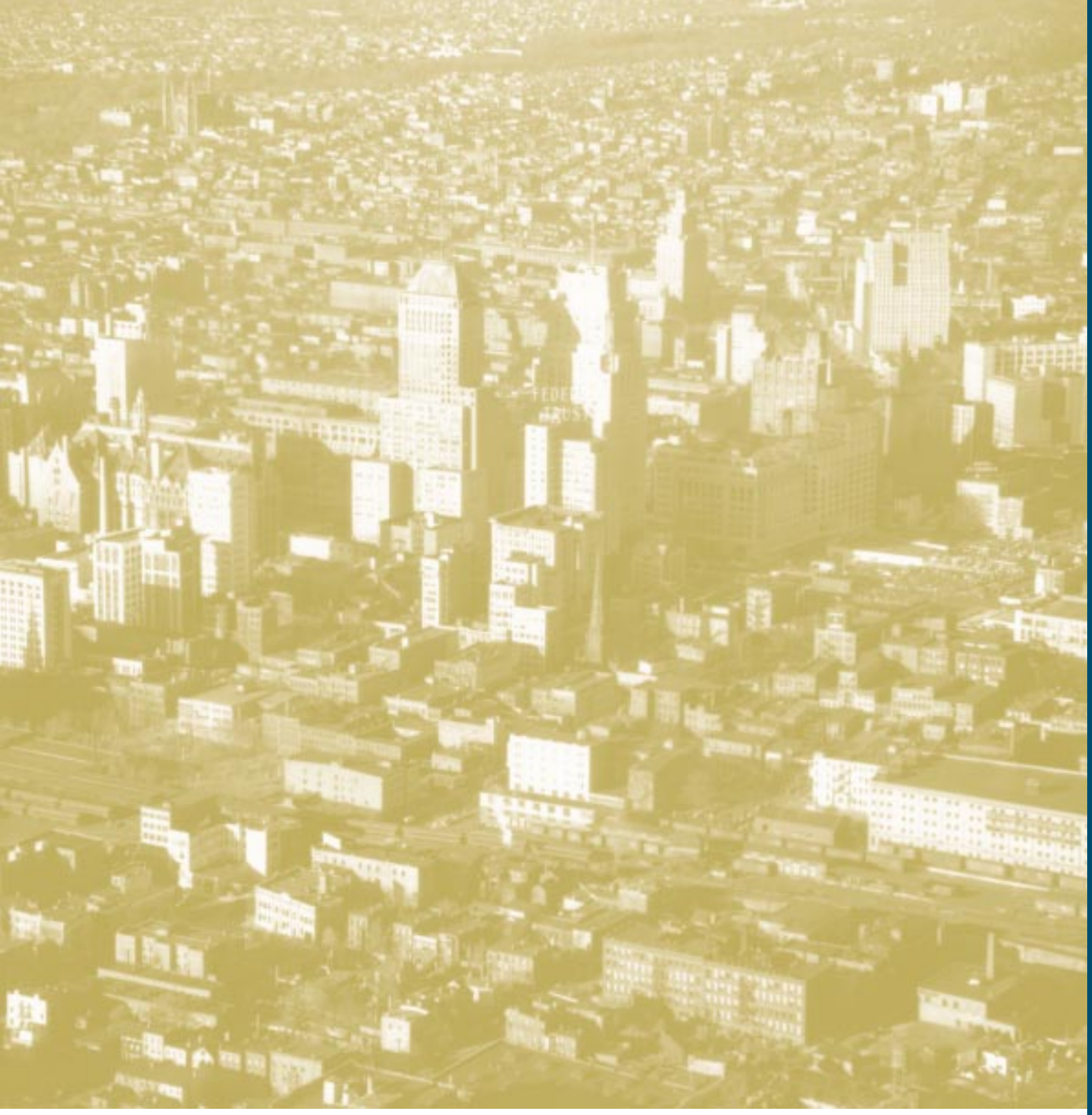
Municipality	Office Space *(in square feet)*
Jersey City	2,429,653
Parsippany-Troy Hills Twp	1,683,446
Mount Laurel Twp	1,509,783
West Windsor Twp	1,303,135
Hopewell Twp	1,248,885
Middletown Twp	1,142,938
Bridgewater Twp	1,051,913
Edison Twp	992,862
Florham Park Boro	889,327
South Plainfield Boro	809,635
Rahway City	685,677
Wharton Boro	602,957
Berkeley Heights Twp	549,796
Bedminster Twp	451,005
Eatontown Boro	450,027
Washington Twp	447,454
Mahwah Twp	446,526
Morris Twp	442,824
New Brunswick City	437,050
Lawrence Twp	435,599

SOURCE: DCA CONSTRUCTION REPORTER

New office space in the second half of the 1990s was built predominantly in suburban locations. There are positive signs for compact communities. Prime urban locations, such as Jersey City and other Hudson River communities, are attracting increasing amounts of new office construction. Other urban locations, such as Newark and Rahway, are capturing significant investments in the renovation of older office buildings. However, smaller compact communities are absorbing very little new space. The lion's share of new office space continues to be provided in dispersed, single-use, often quasi-rural locations.

Employment Growth and Land Consumption

According to the New Jersey Department of Labor, private services-producing industries are expected to add another 850,000 jobs in New Jersey over the next 20 years. Many of these jobs will require office space. If the conventional office park remains the standard, large amounts of undeveloped land will be consumed. For example, the Finance and Business sectors alone are expected to add over 115,000 new jobs between now and the year 2020. These two sectors occupy fairly conventional office space. To provide new office space for these jobs using the conventional office park model will require approximately between 8 and 12 square miles of raw land.

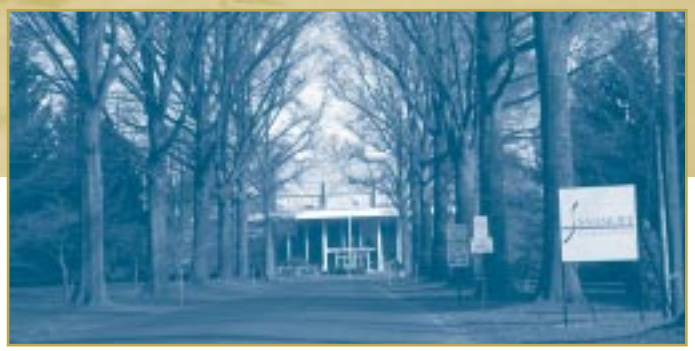


Newark's downtown in 1949 exemplified the mixed-use nature of the traditional city. Large-scale and small-scale office, industrial and retail facilities were closely integrated with residential, civic, educational and other uses within a pedestrian- and transit-supportive environment.

The Separation of Office Employment From Community

At the midpoint of the 20th century, the still vibrant traditional mixed-use downtowns co-exist unsuspecting with the early precursors of the contemporary corporate office park.

The optimism and naivete of the day prevented a full and timely understanding of the profound consequences of this new trend.



The RCA Victor campus in Penns Neck near Princeton in 1948. Located on the outskirts of the traditional crossroads village of Penns Neck, this facility is an early precursor of the contemporary corporate office complex. The campus combines a highway frontage on U.S. Route 1 with frontage onto a traditional neighborhood of small-lot, single-family homes developed after the facility opened. While there is highway access to the campus, the neighborhood streets also provide access, both by car and on foot.

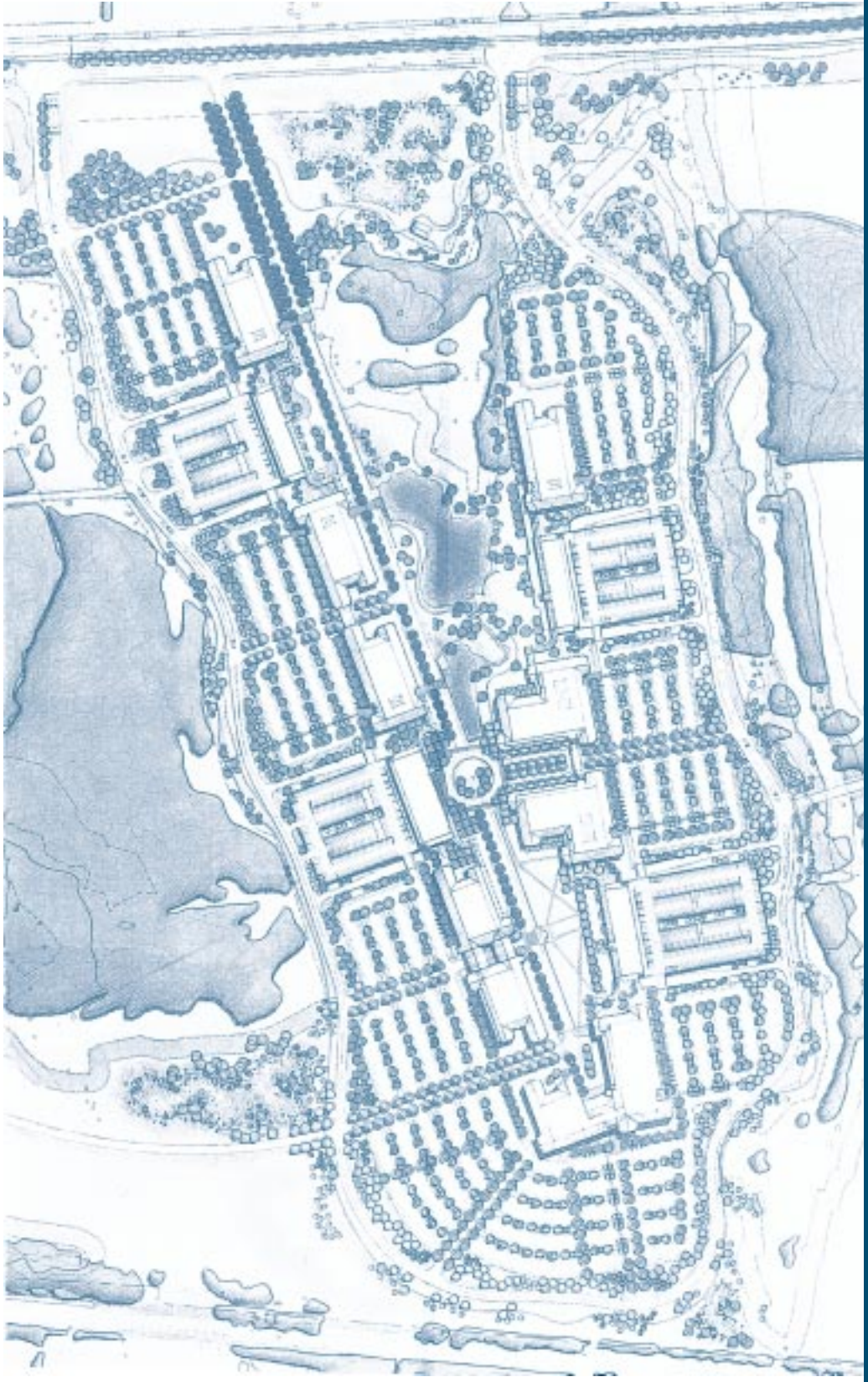
A view of the Bell Labs Murray Hill complex in 1948. The Union County host town of Berkeley Heights had a population of 3,466 in 1950 when this facility opened. By 1960, its population had grown to 8,721 and to 13,078 in 1970. Another early precursor of the contemporary corporate office complex, this suburban campus remains more effectively insulated from surrounding land use than the RCA Victor campus.

Merrill Lynch's Scotch Road Office Park in rural Hopewell Township, Mercer County, offers insights into the thinking behind the contemporary corporate office park.

The office park will be located on 450 acres of farmland and woodlands adjacent to the I-95/Scotch Road interchange. The approved plan calls for the office component to be focused in two campuses — North and South. Other non-residential uses — retail, conference center, hotel and light industrial will be located throughout the remaining site. The campus will contain a total of 3.5 million square feet of non-residential uses and between 10,000 and 11,500 jobs.

It will generate 11,000 a.m. and p.m. peak-hour car trips and 350,000 gallons per day of sewage. Scotch Road, a largely rural, two-lane road, was recently widened to four lanes plus left turn and deceleration lanes. Three traffic lights will be installed. The I-95/Scotch Road interchange will be upgraded to a full cloverleaf.

The 215-acre North campus, currently under construction, comprises about 1.4 million square feet of office space in three and four story office buildings arranged in a "V." The buildings face the inside of the "V", a 20-acre "commons." This long (3,000+ feet) triangular piece of open space will contain a variety of natural amenities — a five-acre water garden with two man-made ponds, a stream and a waterfall; wetlands and wetlands



The illustrative site plan for phase 1 of the Merrill Lynch Scotch Road office park. Buildings are organized in a "V" defining an interior open space, with parking and vehicular access on the outside. The peripheral access road offers a public realm with stark contrasts — manicured open space on one side and a harsh succession of surface and structured parking facilities on the other side. Access inside the "V" is provided by a single road offering a more civilized view of building facades. This road terminates in a "quad" area reminiscent of the college campus, the only area where walking between buildings can legitimately be expected to occur. The two legs of the "V" provide a linear model of development, which accentuates distances between buildings.

man-made ponds, a stream and a waterfall; wetlands and wetlands buffers; stands of trees; and a water-quality basin.

An outdoor area enclosed by four buildings mimics a college quad. Another small outdoor area will contain corporate sculpture, eating and sitting terraces and a water overlook. Jogging trails and facilities for softball, tennis, basketball and volleyball are also included.

Overall, this plan promises to create a series of pleasant places drawn from the imagery of the college campus, the spa, the country club and the rural estate — none of which have traditionally been associated with the work place.

While one side of the office buildings overlooks this idealized landscape, the other side faces a harsher reality: more than 6,000 parking spaces are to be provided in a string of surface lots and parking decks located between the buildings and a loop access road.

Employees are expected to drive to work — no other form of transportation is even considered. And yet, the right-of-way for the West Trenton railroad line borders the entire eastern edge of the site. A study is currently under way to evaluate the feasibility of reinstating passenger service on this line.

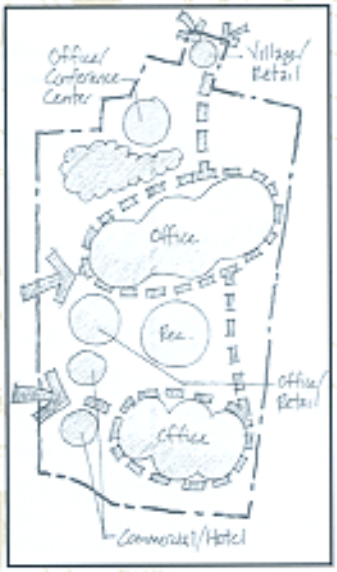
But instead of embracing this extraordinary opportunity, the plan for the office park turns its back on the train station. Office parking lots and the high-volume loop road separate the office campus from the train station. Pedestrian connections are seriously discouraged.

The plan contemplates a few ancillary uses within the office campus, such as cafeterias, banking and some retail and services, but access to these uses is limited to the office workers.

It is ironic that with 14,000 to 16,000 jobs per square mile, the office park's employment density will be twice that of Trenton and 50 percent more than that of Princeton Borough, while resulting in an extremely low site utilization.

The overall floor area ratio of .18 — that is 18 square feet of building for every 100 square feet of land — suggests serious under-utilization of a site with public water and sewer. This can only be explained by the absence of housing and all the other uses which constitute a complete community.

Background Photo: The conceptual site plan for the Merrill Lynch Scotch Road office park illustrates many of the shortcomings of this approach to designing employment centers. Although many buildings are within walking distance, walking is discouraged. The office park completely turns its back on the potential train station (visible at the right edge of the site) suggesting that planners expect all trips to be vehicular.



The design concept for Merrill Lynch's Scotch Road office park illustrates the "pod" approach to land development. The site is divided into a series of pods or single-use areas: two large and one smaller office pods, a conference center pod, a recreation pod, a commercial/hotel pod and a village retail pod.

Introduction

New, compact mixed-use centers, where the office work place is closely integrated with the overall community, are most likely to occur if they do not require developers, corporate tenants, architects and others to deviate substantially from the established practices and prototypes of conventional sprawl development. In this section, we examine the physical requirements of the generic contemporary office building and evaluate to what extent these are compatible with a traditional framework of streets and blocks.

The physical fabric of a community is defined first and foremost by its circulation system, which subdivides the landscape into blocks of developed and undeveloped, public and private lands. Older, traditional communities have a "fine grain" — circulation systems with many smaller streets and many intersections. These dense circulation systems define pedestrian-scale blocks, usually measuring between 200 and 800 feet and containing from two acres to five acres. Occasionally, much larger blocks are incorporated to accommodate large facilities, like a manufacturing plant or a hospital. More recently developed suburban communities, on the other hand, have a "coarse grain" — sparse circulation systems with fewer (but considerably larger) roads and intersections and a much greater reliance on private "driveways" instead of public streets. These circulation networks define large blocks of land and are designed for vehicular, not pedestrian movement.

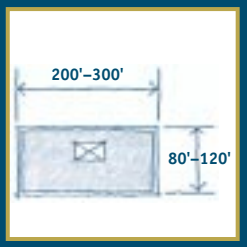
Many communities developed after the 1950's have a "coarse grain" — a circulation system that defines large blocks of land and is entirely auto-oriented.

The physical fabric of a community can be thought of as "building blocks" — buildings and open spaces arranged on a framework of blocks defined by streets. The buildings accommodate different uses, such as housing, retail and offices, each with their own functional requirements.

Traditional communities and sprawl development contain the same general uses — because people's needs are largely identical, regardless of where they live or work — but these building blocks are arranged in very different ways.

Traditional communities have a "fine grain" — their circulation systems define pedestrian-scale blocks of buildings and open spaces. Hoboken's signature 200 by 400-foot grid incorporates a wide variety of building sizes and shapes. Uses with greater space needs, such as the Stevens Institute of Technology, occupy larger parcels that stretch the grid without compromising its integrity.

BUILDING BLOCKS



Contemporary speculative office buildings have footprints that range from 16,000 square feet to 36,000 square feet.

Is it possible to rearrange the basic building blocks of suburbia — the generic buildings and site plans created by speculative developers for maximum predictability and standardization — to create, instead, compact mixed-use environments? Expert opinion suggests that the non-employment uses — housing, civic, community facilities and others — do *not* pose significant challenges to a closer integration with the office work place. Consequently, we focus on the possible issues raised from the point of view of the office work place. Can the principles and concerns that guide development of the conventional suburban office work place be accommodated in a compact, mixed-use environment? Will the office space be marketable and functional?

To answer these questions, we look at the basic building blocks of the suburban corporate office campus and their functional requirements. We start with the generic office building and associated parking, discuss the different functional requirements of structured parking, then examine what happens with the introduction of retail.

The Office Building

The design of generic class A office buildings — the types of buildings capable of attracting blue chip tenants — responds to specific requirements in terms of floor plate, building height, internal layout, entrances and fenestration.

Floor Plates

The generic office building in a suburban environment has a floor plate ranging from 25,000 feet to 40,000 square feet; 35,000 square feet is a very common, flexible and marketable size.

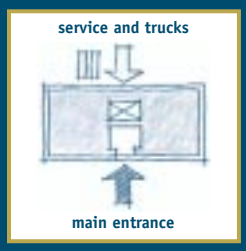
Common floor plate dimensions are 100 feet to 120 feet wide by 250 feet to 350 feet long. These dimensions permit an internal layout combining small, generic cubicles with larger open work areas, and allow single tenants or multiple tenants on each floor. Such a floor plate also allows areas requiring natural light to be near a window and internal circulation to be efficiently minimized.

The generic suburban office building has around 100,000 square feet of leasable space. This size meets the space demands of the contemporary marketplace and is recognized by lending institutions, thus leading to easier financing. Larger buildings can take longer to fill, and are likely to have greater financial carrying costs. Smaller buildings have higher broker and maintenance costs.

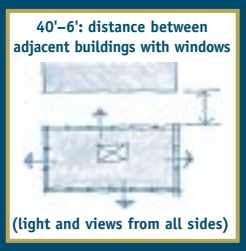
Building Height

The typical size and floor plate of the generic suburban office building usually results in three or four story buildings. This height threshold is reinforced by several other factors:

- Many growing communities in New Jersey's rural/suburban fringe lack firefighting equipment for high-rise buildings. A maximum building height of five floors is often a local requirement.
- Building codes establish different structural requirements for buildings over 10 or 11 stories. These can significantly increase construction costs and therefore constitute another limitation on building height.
- There is often the perception that taller buildings would be visually intrusive and "out of place" and therefore not in character with a generally low-rise suburban or rural setting.



Separate entrances for people and for services are often desirable.



Access to natural light can be an important factor in determining office building design.

Access and Entrances

Individual office buildings require their own main entrance, generally secured by a guard or receptionist. Occasionally, two or more entrances are provided: one from the front, for visitors, and one (or more) from the back and sides oriented to the main parking areas, for employees, deliveries and everyone else.

Consideration is also given to the location of service areas, including loading docks. These are generally located away from the entrances and pedestrian walkways, include areas for dumpsters and for trash removal, and are large enough for moving vans.

Fenestration

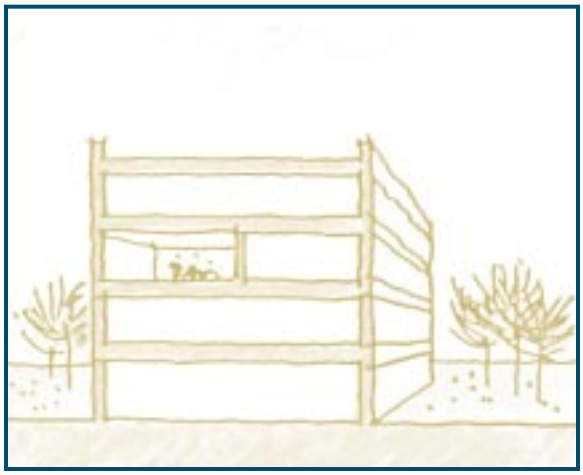
Prime office space requires window views and natural light. Fenestration — windows and other glazed areas — generally occupy a significant portion of the exterior walls of class A office buildings. Large window areas provide light and views for enclosed offices as well as open, shared areas. Natural lighting is considered essential and to a certain extent dictates not only the design of individual office buildings, but also the distance between buildings — an important consideration in compact, walkable environments. Setbacks between buildings (note the typical floor plates discusses above) are not only set by fire-protection standards, but also by the need to create pleasant working environments, with windows for both light and views.

Surface Parking

Most suburban office buildings are served by surface parking lots, although two-level parking decks are not unusual in higher-quality office parks. Multi-level decks are common in urban areas but found only in prime suburban locations.

Parking ratios vary from three spaces to five spaces per 1,000 square feet of gross leasable floor area, depending upon the type of office activity. Traditional uses have lower parking ratios while "back office" uses (such as data entry and processing, billing, telemarketing and others) have much higher ratios. This means that for every 1,000 square feet of office space, there will be between 810 square feet and 1,350 square feet of parking.

Single-use buildings are self-contained. There is no public access and no connections to other uses or to the broader community.



Mixed-use buildings provide public access to their facilities and are linked to the surrounding retail and office tenants as well as the broader community.

Parking-lot design generally tries to locate the furthest parking stall no further than a five-minute walk from a building entrance. On smaller sites, surface parking can be expected to occupy up to 40 percent of the site at build-out and represent up to 70 percent of the site's impervious surface.

Functional Differences Between Single-use and Mixed-use Buildings

What are the functional differences between single-use and mixed-use buildings? What are the practical implications of having more than one use in a building? These can be illustrated by comparing a single-use office building with an office building with retail on the ground floor.

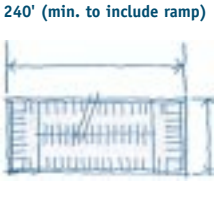
SINGLE-USE OFFICE BUILDING	MIXED-USE OFFICE/RETAIL BUILDING
Offices occupy every floor, including ground floor.	Ground floors are partially or totally dedicated to retail. There is either less office space or one additional floor.
Building is often set back considerably from the street. Landscaping and lawn space between road and building enhance privacy for ground-floor offices. Even when sidewalks exist this arrangement deters pedestrian activity.	Building is often close to the street. Ground-level retail and restaurants animate adjoining sidewalk and deliberately draw pedestrian activity.
Offices require a single main lobby entrance.	Offices require dedicated entrance, usually a lobby with a guard and waiting area. Retail has separate entrances, usually from the street.
Deliveries and trash removal apply to offices only.	Deliveries and trash removal apply to both offices and retail with different requirements. Deliveries arrive at different times. Restaurants require more frequent garbage removal. This cannot impact on the quality of the office space above. In some cases separate delivery areas may be required.
Operating schedules and security procedures apply to office use only.	Operating schedules and security procedures apply to both office and retail. They are likely to be different and need to be reconciled.
Facilities, such as health clubs, which are located inside the building are usually restricted to building tenants.	Facilities are usually open to the public.

Parking garages can be easily designed to include retail within the basic building structure.

Structured Parking

Surface parking lots consume large amounts of valuable land. They are physical barriers between uses and destinations, making walking trips long and unpleasant. They generate enormous amounts of run-off, contribute to non-point source pollution, create or magnify heat islands due to the absorption of heat by blacktop, and generally are an environmental liability.

Structured parking is more benign both to the community's physical fabric and environmentally. It is widely recognized as a key component in creating compact environments of any sort. However, it is considerably more expensive than surface parking (by up to a factor of five) and so considerations of efficiency and cost savings drive parking deck design more than they do other uses. Generally, parking decks are simply designed and open to the air. Rectangular forms are frequently preferred, and separations between garages and adjacent buildings are usually needed.



Parking garage layout is standardized and fairly inflexible.

If parking lot design is relatively inflexible, with fairly rigid standards — 9-foot by 18-foot stalls, 24-foot wide aisles — the design standards used for parking decks are even more rigid. Specific requirements for structured parking are as follows:

- A standard parking bay, with 90-degree parking, is about 60 feet wide (plus column dimensions in some layouts). Parking is usually provided in multiples of this 60-foot module, often as two bays (120 foot width), but sometimes in wider garages, with 180-foot or 240-foot widths.
- The normal floor-to-floor height is 10 feet.
- The typical garage ramp requires about 180 feet in length to go up 10 feet. With parking against both end walls, the typical parking garage is at least 250 feet long.
- Two stairs, plus elevators, are required. The maximum distance between stairs is often about 250 feet to 300 feet.
- Local building codes require air and ventilation on at least three sides of a garage and often on all four sides, otherwise exhaust fans are required, adding to the parking structure's construction and maintenance costs. For this and other reasons, underground garages are often cost prohibitive.
- Typical column spacing is 30 feet by 60 feet. This module can generally be coordinated with the layout of office space on upper levels. But the added columns for the offices reduce the efficiency of the garage, and the stairs and elevators for the office building need to pass through the garage, further reducing parking efficiency and increasing costs per parking space.
- Controlled entrances require garage openings that are wide enough and flat enough to handle rush-hour traffic. Garages with over 800 parking spaces usually require two such entrances, in order to handle rush-hour traffic smoothly. Both entrances must lead to the internal ramping system.

Parking Decks With Ground Floor Retail Uses

If retail space is included at the ground floor, the floor-to-floor height is increased to at least 17 feet, to accommodate higher ceilings, plus lighting and duct work. This added height will in turn translate into a longer ramp (at least 250 feet) to the second floor.

Deliveries to the retail uses should be accommodated and carefully coordinated with the parking design. If delivery and garbage trucks are to drive under the garage, the clear height and the space for parking and ramps require careful design consideration.

Retail and Restaurants

Chain stores and restaurants typically use standard floor plans. Independent stores and restaurants are more flexible and can adapt more easily to non-standard layouts. Typically, small shops or restaurants are 60 to 80 feet deep, from the front of the store to the back. Stores and restaurants can vary greatly in size, from as little as 500 square feet to as much as 25,000 square feet. A typical chain drug store, for instance, needs about 11,000 square feet to 14,000 square feet, while a small cafe may need only 1,000 square feet.

Stores and restaurants require efficient deliveries and garbage removal, preferably in the rear. To the extent possible, shopping streets should be free from bags of trash, large trucks idling and garbage pick-up.

Retail stores located in a mixed-use building require individual service and delivery entrances, their own front doors, as distinct from the office entrance, and their own signage systems. They also require large storefront windows, no matter what the design of the window of the office building.

Retail must be carefully planned in order to succeed — adjacency and continuity are essential.

Parking structures with ground floor retail require increased ceiling heights, plus space for deliveries and trash removal. Large store-front windows must also be accommodated, and the garage façade itself should be designed to make the shopping street attractive and pleasant. Although garages must be economical, their appearance has a major effect on a street that is planned for retailing and pedestrian movement.

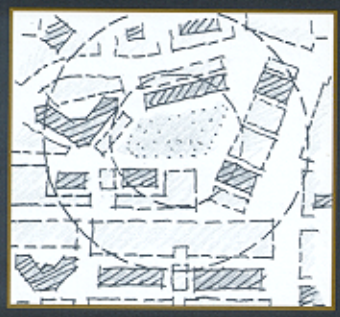
Front entrances and retail store fronts should be contiguous, to create a "continuity of doors and store fronts" that make walking trips interesting and pleasant. When pedestrians walk easily from store to store, a "bounce" of walking shoppers occurs along a sidewalk, and across a walkway or street. Interruptions to the flow and bounce, created by parking lots and other non-retail uses should be minimized, because stores located around a corner or further down the street might well lose the shopper flow. Shopping areas should be continuous and compact. Surveys have shown that the average office worker walks no more than 1,500 feet during lunch break. Shops that depend on this clientele must be within this radius to succeed.

Walking Distances

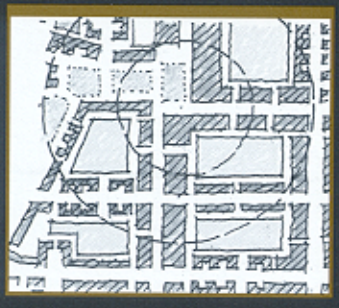
An easy and comfortable walk — from office to shop, from office to office, and from residence to shop and office — is a fundamental attribute of successful compact, mixed-use environments. The walking distances which average people are willing to walk are well documented. In a compact, mixed-use environment, these walking distances will largely determine the size and relationships of development blocks and parcels and the overall structure of the area. Key walking distances include:

- From parking space to office or shop entrances: a maximum of 500 feet.
- From office entrance to shop or restaurant entrance: a maximum of 1,500 feet.
- The desired length of a shopping street (just as in a suburban shopping center): 1,500 feet.
- From home to work: a maximum of about ½ mile (or 2,500 feet).
- From home to shop: a maximum of about ¼ mile (or 1,300 feet).
- From home or office to mass transit: between ¼ mile and ½ mile.

These walking distances are instrumental in shaping how the building blocks of a mixed-use community are assembled.



In a suburban office-park environment, any area defined by 500-foot and 1,000-foot radii will encompass mostly parking lots, detention/retention facilities, roads and landscaping. Few buildings or activities are accessible on foot or by transit and the way to reach them is not safe, comfortable, interesting or rewarding. Walking is, at best, a recreational activity and plays no functional role in transportation.



In a compact, mixed-use environment, any walking precinct defined by 500-foot or 1,000-foot radii will encompass a variety of activities and uses. Walking is safe, comfortable, interesting and rewarding. It is a fully functional and viable form of transportation.

Key Issues Affecting Development of the Office Work Place

Early in 1999, a series of telephone interviews were conducted with many professionals that influence decisions about the location and character of office development in New Jersey. The opinions of office developers, designers, real-estate professionals and corporate facility planners were sought in order to understand the most important criteria used in making decisions about where to locate office facilities and how to design them. The results were documented and presented to a roundtable discussion with participation of the disciplines involved in these decisions.

Expert opinion named seven specific concerns guiding decision-making: identity, access, flexibility, control, security, recruitment/retention, and costs. Each of these concerns can be powerful in determining whether office development is stand-alone or part of a mixed-use development. We look at each of these concerns in turn and describe how it is addressed in an isolated office park setting and, by contrast, in a compact, mixed-use setting.

Identity

Image-conscious corporations prefer buildings and grounds that reflect their personalities and corporate presence. While some choose nondescript buildings, others select buildings that are both architecturally distinct and highly visible to the public.

- In the isolated office park, corporate image and identity are conveyed by signature buildings surrounded by spacious lawns. Visibility from a high-volume road provides exposure to motorists, but corporate facilities are perceived as remote and inaccessible. This setting emphasizes corporate individuality over community.

▲ *In a compact, mixed-use environment, corporate image and identity are conveyed through appropriate architectural and urban design solutions. Corporate individuality is expressed in ways that recognize the scale and character of the surrounding neighborhood. The corporate work place is both visible and accessible to pedestrians, motorists and transit patrons. It is perceived as an integral part of the community. This setting emphasizes community over corporate individuality.*

Accessibility

Office tenants require easy access to their facilities for their labor force.

- In the isolated office park, accessibility is largely limited to single-occupancy vehicles. Large peak-traffic flows place a heavy burden on the roadway system — particularly the arterial and highway networks — often requiring extensive and costly improvements.
- *In a compact, mixed-use environment accessibility is multi-modal —pedestrian, bicycle and transit in addition to single-occupancy vehicles. Peak traffic is dispersed. Road improvements are limited.*

Flexibility

Flexibility in both building layout and site layout is highly prized. Corporations like the ability to add workspace, by occupying additional buildings if demand increases. Conversely, corporations like to have an "exit strategy," the ability to easily move out and find new occupants for buildings they own.

- The large corporate campus with signature buildings is unwieldy and often difficult to retrofit for new tenants. The "pod" layout — large areas assigned to specific uses — found in office parks is not easily adaptable to changing spatial requirements. Large, former single-user buildings may be difficult to subdivide and market to smaller tenants.
- *The modified grids found in compact, mixed-use environments provide the most flexible approach to spatial layout. The discipline imposed by the well-defined spatial structure guarantees a coherent whole while easily incorporating facilities of all sizes and floor plates, including the standard office building and parking deck.*

Predictability

Corporations like a measure of control over their immediate surroundings. Incompatible or inappropriate uses can diminish the quality of a location.

- The large suburban corporate campus contains, in part, its own environs — the lawns, storm-water detention facilities and so forth. Local zoning provides some limited measure of predictability beyond the limits of the corporate compound. But many highway-oriented corporate facilities end up with gas stations, fast-food outlets, retail outlets and other less-than-blue-chip-uses as neighbors. In addition, and unlike retail uses, which thrive on traffic, corporations with a highway-oriented location do not benefit from the heavy traffic which daily passes by their front door. It is a nuisance for the workforce, which must constantly struggle with traffic, and brings no value added to the corporation.
- *In a compact, mixed-use environment, corporations can reasonably rely on the existing or proposed pattern of streets and blocks to shape development or redevelopment options in their vicinity in predictable fashion. Local zoning will provide as much protection as it does in exurban locations. Bulk and height parameters for the area can be expected to shape individual buildings. Design guidelines can control the character of new construction.*

Security

Personal security of employees and the general security of facilities and business operations is an important criteria in determining location and design.

- In isolated office parks, the limited number of vehicular-access points can be controlled by gates that are either card activated or manned by security guards. Only vehicular access is permitted. The wide expanses of lawn, surface parking and detention facilities surrounding the building(s) physically discourage unauthorized pedestrian access to the compound and make any pedestrian movements highly conspicuous visually.
- *In compact, mixed-use environments, access to a building or group of buildings is controlled by security guards posted at lobbies and entrances to parking garages. Card-activated elevators and individual office suites provide security inside the building.*

Recruitment / Retention

In a tight labor market, corporations need to offer quality-of-life incentives to recruit and retain employees. Convenient access to restaurants, child care, health clubs and other uses is increasingly important.

- In isolated office parks, goods and services are accessible only by car. For convenience, corporations underwrite cafeterias, health clubs, day care and other uses and provide space for these in their buildings or within the compound. These uses are used exclusively by the corporate workforce — a limited market — and consequently are often heavily subsidized.
- *In compact, mixed-use environments, corporate employees rely on a variety of goods and services offered by the marketplace — either in the building or in other buildings — within easy walking distance. These businesses draw from a much larger market, since they are open to the outside community. Corporations are not responsible for providing space, subsidizing or managing these businesses.*

Costs

Development and operating costs can vary significantly with location and type of development. Cost-conscious decisions can preclude more expensive development options.

- Development of isolated office parks on greenfield sites at the suburban fringe may require large investments in new infrastructure. It is also highly land-intensive, given the generally low development intensities and the land needs for surface parking, storm-water management facilities, buffers and setbacks, etc. On the other hand land may be less expensive and the permitting process less difficult.
- *The high cost of structured parking is the single most important cost feature affecting development of new compact, mixed-use environments. It may be offset in part by the higher development intensity, which it allows, as well as by savings due to lower parking ratios, shared parking and increased transit use.*

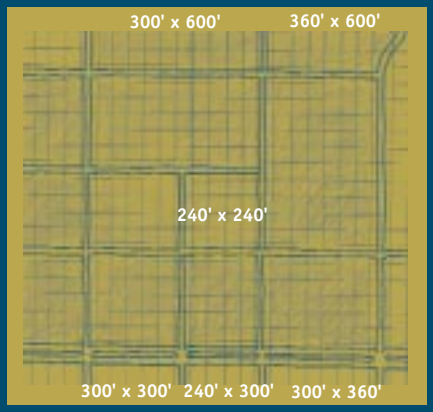
Assembling the Building Bocks

The physical fabric of traditional communities contained a wide diversity of building foot prints and building sizes, from the very large to the very small. The grid or modified grid extended, where necessary, to incorporate larger buildings and sites. It did not prevent space-intensive uses — such as manufacturing, warehousing or education — from locating within the community, fully accessible to pedestrians and transit. This flexibility is a real asset in terms of being able to accommodate contemporary trends towards larger building foot prints, whether for "big-box" retail or corporate office buildings, without losing the human scale.

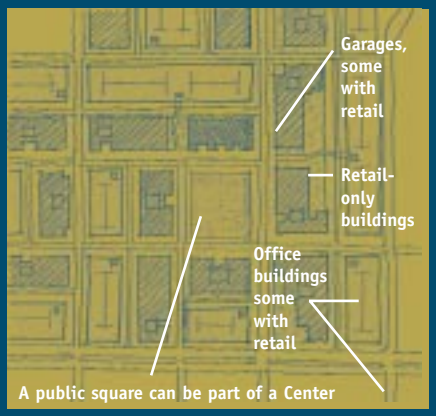
Assembling the building blocks requires a physical framework to plug them in. A 60-foot-by-60-foot grid responds to both standard street widths and the standard dimensions of generic office buildings and garages. A grid or grid-like framework based on the 60 foot module can generate a wide range of block sizes, and easily accommodate a great variety of building sizes and types based on the industry standards discussed earlier. Block widths in the 240-foot to 300-foot range, and block lengths in the 360-foot to 480-foot range can accommodate very large buildings while maintaining a human scale. There is no requirement that the final street network actually constitute a grid; many variations and modifications are possible.

This type of framework allows flexibility in the design and layout of buildings and garages; the inclusion of retail uses along designated shopping streets; a great variety of development options, from large to small; and the inclusion of individual buildings that are architecturally distinctive, as symbols of the companies that build them. It supports single-use buildings as well as mixed-use office buildings. It can accommodate conventional parking deck configurations, with and without retail. It allows separate, but proximate, building sites for housing and other non-commercial uses. It easily allows the designation of choice sites for public open space. And it makes a phased build-out both possible and economical.

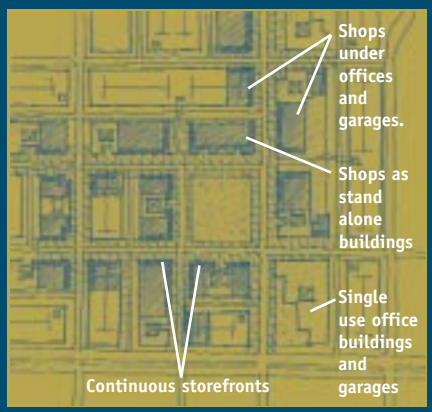
The design issues associated with the form and location of the corporate workplace represent just one component, albeit perhaps the most intractable, of a mixed-use center. Residential, civic, institutional and other uses constitute additional building blocks, which can and should be layered onto this framework. The "Visualizations" section of this book explores the relationship between the employment "core" and the rest of the community, using as an example an idealized regional center that conforms to State Plan guidelines.



The spatial framework for the core of a compact, mixed-use center. Simple modular frameworks can work with most contemporary building types, accommodate a variety of parking arrangements and protect prime street frontage from service needs while maintaining quality walking environments.



Schematic view of the core of a mixed-use center. Blocks vary in size and configuration to accommodate a variety of building shapes and sizes as well as parking garage types and public open space. Some streets are lined with retail. Both single- and mixed-use buildings are easily accommodated.



Mixed-use environments allow a wide variety of combinations between uses, including combinations of mixed-use and single-use buildings. Mixed-use buildings may include ground floor retail, with office, housing, civic or other uses above. Other buildings may be retail or office or housing only. Single-use buildings are perfectly acceptable in a pedestrian environment. Retail frontages should be continuous.

NEW MIXED-USE CENTERS

New mixed-use centers with large employment components have not been popular in New Jersey in the second half of the 20th century, yet there is a growing number of examples from other parts of the country. While these projects share a common approach — creating compact, mixed-use environments — they do not follow a single model or formula and can be very different in terms of design, development program and other specifics.

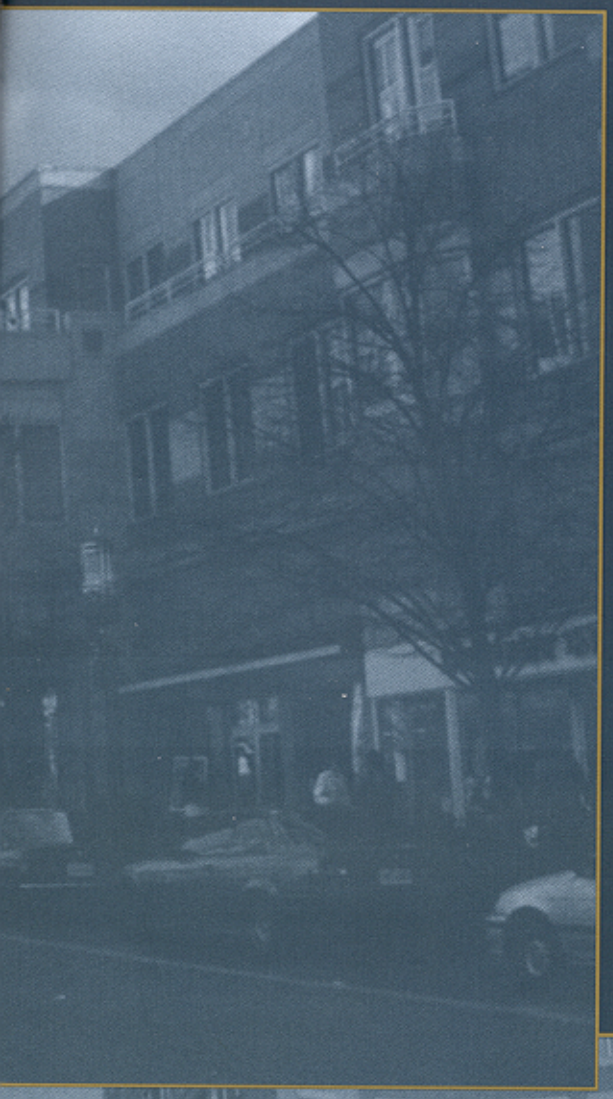
Some, like Northwest Landing and Whitehall, are envisaged from the start as master planned communities of housing, retail and civic, in addition to offices. In others, such as Redmond and Reston, the mixed-use town centers are late additions to pre-existing, non-centered communities that were viewed as incomplete. At Legacy, a large pre-existing office park is being retrofitted with a mixed-use town center containing housing, retail and civic. Playa Vista is a very large infill project in an established urban area.

These same projects illustrate a range of approaches to integrating the office work place into the community. The offices may be concentrated in a single district or dispersed in several nodes. They may comprise a single-use district or be integrated into a mixed-use area. They may consist of single-use office buildings or be part of mixed-use buildings. In other words, in these examples, the office work place may be more fully integrated or only somewhat integrated — but it is not isolated — from the surrounding community as in the conventional office park. In addition, a pedestrian-scale design further differentiates these examples from the conventional office park.

REDMOND TOWN CENTER, WASHINGTON
The first phase of this 120-acre project opened in December of 1997 with 450,000 square feet of retail and office space. The next phase included a new corporate headquarters for AT&T Wireless. Three of the six AT&T buildings are occupied. Three more are planned, bringing the headquarters to 600,000 square feet. Other tenants include a Lake Washington School District Library, 200 apartments, and a 175-room hotel. The experience here indicates that office buildings in mixed-use centers can be quickly tenanted, leased, and sold.

RESTON TOWN CENTER, VIRGINIA

In the 1990s the commercial core of Reston was finally realized. The Town Center comprises 15 acres and includes a 515-bed hotel, six street-side restaurants, more than 60 shops in 220,000 square feet of retail space, 500,000 square feet of office space and parking for more than 1,000 cars. Reston Town Center offers an engaging series of public spaces with a high degree of quality and visual interest. It supports 18-hour-a-day activity. Shops and restaurants serve employees during working hours. The evenings bustle with shoppers, hotel guests, and restaurant and theatre patrons.

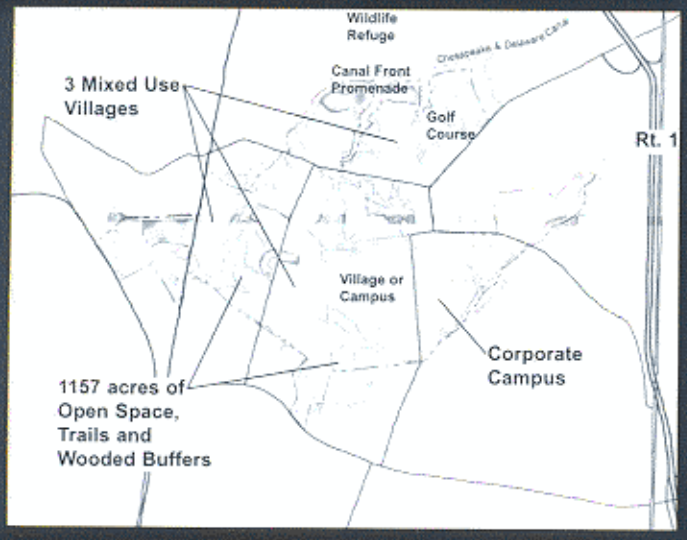


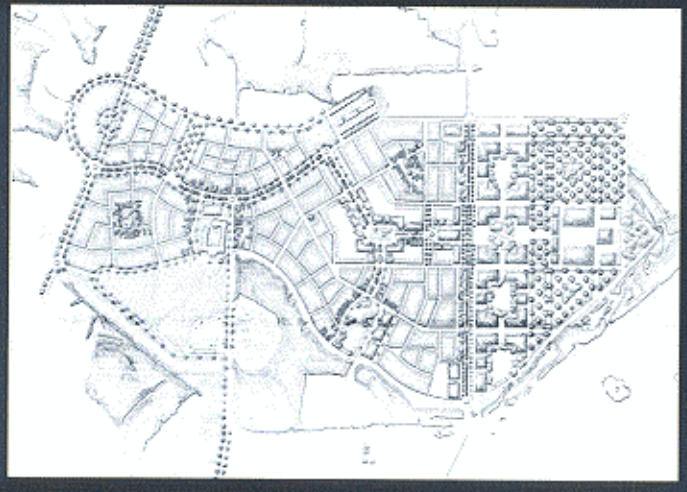
LAGUNA WEST, CALIFORNIA
The 800-acre site near Sacramento includes a 450,000-square-foot office complex for Apple Computer, 3,000 units of housing, recreational facilities, civic buildings, and retail that functions both as a strip center and neighborhood center. The designers successfully integrated standard development types (the low-rise office building with four parking spaces per 1,000 square feet of leasable area is one example) to create a successful mixed-use community, adding value to both the commercial and the residential product.

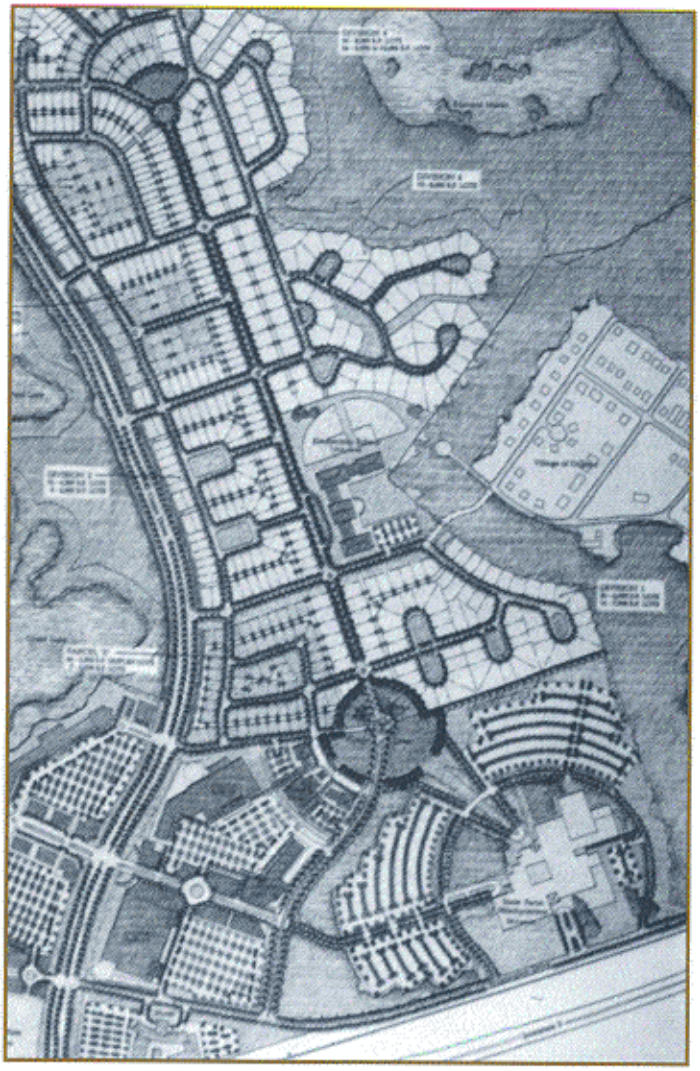
LEGACY TOWN CENTER, TEXAS
Legacy, near Plano, Texas began in 1985 as a conventional, large-scale corporate campus covering 2,000 acres. Portions of this were developed and occupied by a dozen companies, employing over 3,000 people. A preschool, a university branch campus, several hotels, and new apartment buildings began to diversify the land use base. Now, a new town center designed by Andres Duany is planned to contain a mix of apartments, houses, shops, hotels and offices in a pedestrian-oriented, close-knit environment. Legacy is unique in that the employment base predates the mixed-use center.

WHITEHALL, DELAWARE

This 2,000-acre site is planned for over 4,000 residential units and includes a 200-acre employment center where the state would like to attract semiconductor manufacturing. The challenge of how to integrate large, low, often blank-walled buildings (with huge parking lots) into a vital community that invites people to walk is well met in this plan. These facilities are located along one side of a broad boulevard with the primary parking lots located behind the office buildings.







NORTHWEST LANDING, WASHINGTON

The plan for Northwest Landing arranges the typical elements of land development to create a successful, artfully planned, mixed use community. Built or being built are: an office campus for State Farm, employing 450, and a larger facility for Intel that is expected to employ 6,000. The overall community master plan includes 5,500 residential units, 300 acres of office development and three "Main Street" retail areas. The property owner and developer is Weyerhaeuser, the well-known forest products company. Weyerhaeuser predicts that eventually 8,600 people will work at jobs at Northwest Landing and hopes that 30 percent of the development's residents will work at one of those local jobs.

PLAYA VISTA, CALIFORNIA

Playa Vista encompasses 1,000 acres of the former Hughes Aircraft facility in Los Angeles. Phase I recently received approvals and financial commitments for 3,600 residential units and 3.6 million square feet of office and studio space. The overall project is planned for 13,000 housing units to be built out over 15 years. The employment centers are located to benefit from proximity to one or more of the waterways or riparian environments on site. The challenge of a "wet site" has been met and converted to an advantage.

Visualizing a Planned Regional Center

Reintegrating employment into communities can only occur through the creation of new mixed-use environments. Visualizing new mixed-use environments that link employment with the other elements of a complete community is an important step in this direction. Visualizations can help public officials and other interested parties grasp the very substantial differences between the single-use and the mixed-use models of employment and community. To this end, a prototypical mixed-use center was developed. A regional center was chosen for illustration purposes because it is the most employment-intensive of the New Jersey State Plan's hierarchy of planned centers. The State Plan expects most new office employment outside of urban areas to occur in existing or planned regional centers.

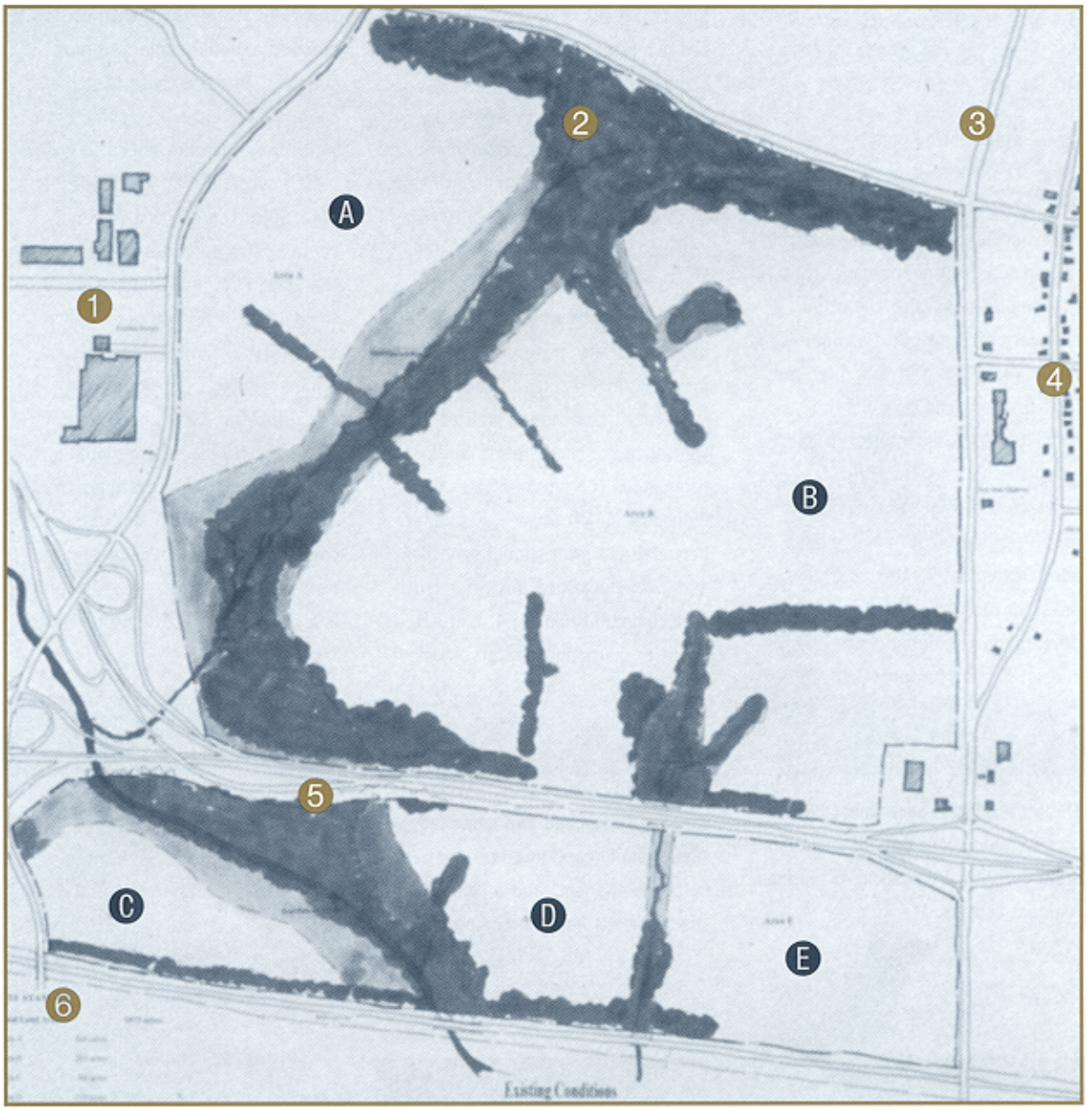
The State Plan's Concept of the Regional Center

The regional center is defined by the State Plan as an employment concentration of regional significance surrounded by, or in proximity to a critical mass of housing, and supported by institutional, civic, recreational and other such uses. It offers a variety of goods and services for a regional market. It includes large retail facilities as well as specialized or niche retail, large-scale commercial (corporate offices, industrial parks) as well as smaller personal and professional services, mid-size educational facilities (such as a community college), cultural facilities (regional theaters, music halls, etc.), civic and others. The range of housing types should be fairly broad, with an important multi-family component, a wide variety of attached and detached single-family configurations, a sizable rental component, and a significant special needs housing component.

The 1992 State Plan identified 14 planned regional centers in nine counties. To date, these identified centers have either not come to fruition or have developed in ways not compatible with the State Plan's objectives. Ten existing regional centers have been designated by the State Planning Commission since 1992, including places such as Red Bank, Newton, Morristown, Bridgewater/Raritan/Somerville, and Princeton Borough/Princeton Township. No planned regional centers have sought designation and none appear eminent and yet, concentrating employment and residential growth in these centers is a central goal of the State Plan.

THE STATE PLAN'S QUANTITATIVE CRITERIA FOR DESIGNATING PLANNED REGIONAL CENTERS

- minimum gross population density of 5,000 people per square mile
- minimum gross housing density of three dwelling units per acre
- over 10,000 jobs (5,000 in planning areas 3-5)
- over 10,000 population (5,000 in planning areas 3-5)
- jobs-to-housing ratio of 2:1 to 5:1
- land area of one to 10 square miles



A hypothetical 1,800-acre site was imagined, taking care to make it represent generic New Jersey conditions. The relatively flat site is served by two limited access highways, as well as by rural arterials, and is traversed by a significant stream corridor with associated wetlands. The major roads and the stream corridor subdivide the site into five distinct development areas. Existing industrial, commercial and residential development found both within and adjacent to site constrain the design of the new center.

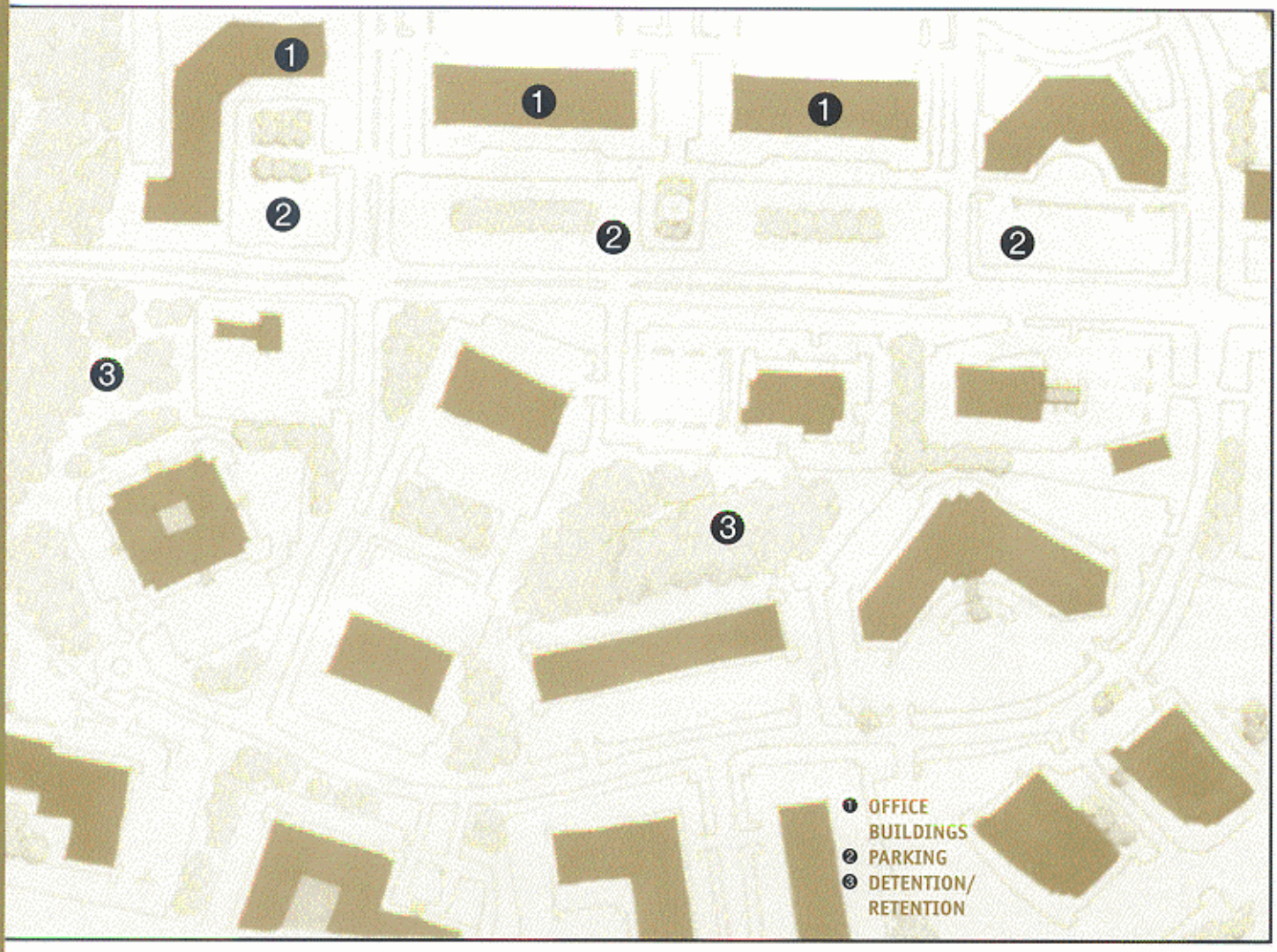
1. EXISTING INDUSTRIAL
2. STREAM CORRIDOR/WETLANDS
3. STATE HIGHWAY
4. HISTORIC VILLAGE
5. INTERSTATE HIGHWAY
6. RAILROAD LINE

The Development Program

Taking the State Plan criteria as a starting point, a development program for a prototypical community of 10,000 people and 10,000 jobs was developed, based on an analysis of the employment, housing and land use characteristics of 10 existing regional centers designated by the State Planning Commission. It was assumed that 15 percent of jobs would be in retail/entertainment, 15 percent in wholesale/ manufacturing, 65 percent in office (finance, insurance, real estate, and services, including a 200,000 square-foot health facility and a 250-room hotel/conference center); and five percent in public education. This translates into 525,000 square feet of retail space, 1.5 million square feet of wholesale/manufacturing space, and 1.6 million square feet of office space. The civic component includes three elementary schools, one middle school, one high school and a community college. The housing component comprises a total of 3,900 units, with 60 percent single-family (at a gross density of 3 units per acre) and 40 percent multi-family (at a gross density of 12 units per acre). Approximately half the site is used for housing, and seven percent for public educational facilities.

Visualizing the Design Differences

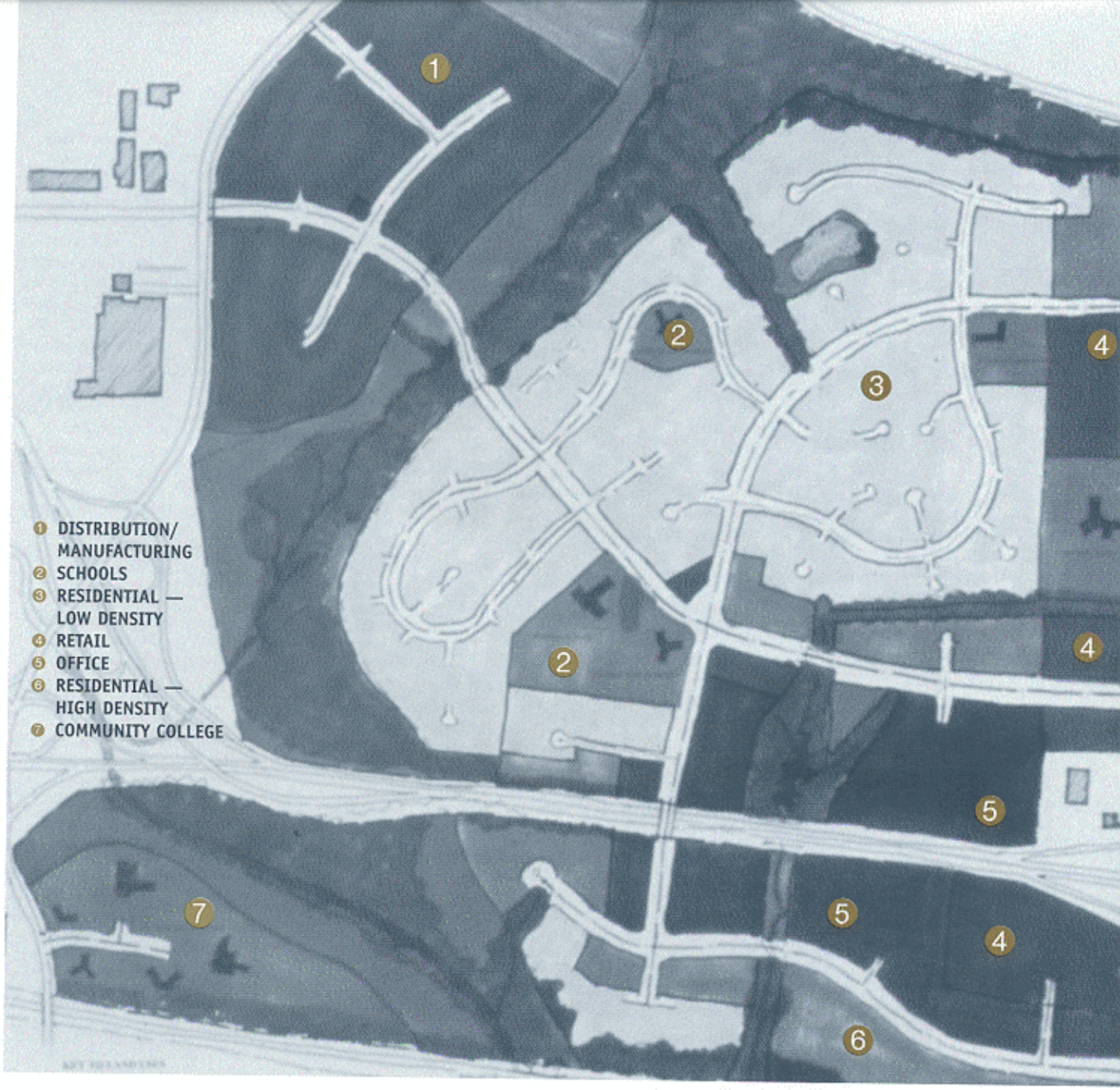
The development program described above was visualized using two different approaches to community design: the conventional, single-use model of development (office parks, residential subdivisions, shopping centers) and the traditional, mixed-use model. These two scenarios were laid out according to completely different design principles. But the overall development program and the densities of individual uses were kept the same, with one exception — at the center, the mixed-use scenario assumes a slight density increase, made possible by replacing surface parking with structured parking.



The Single-use Development Scenario

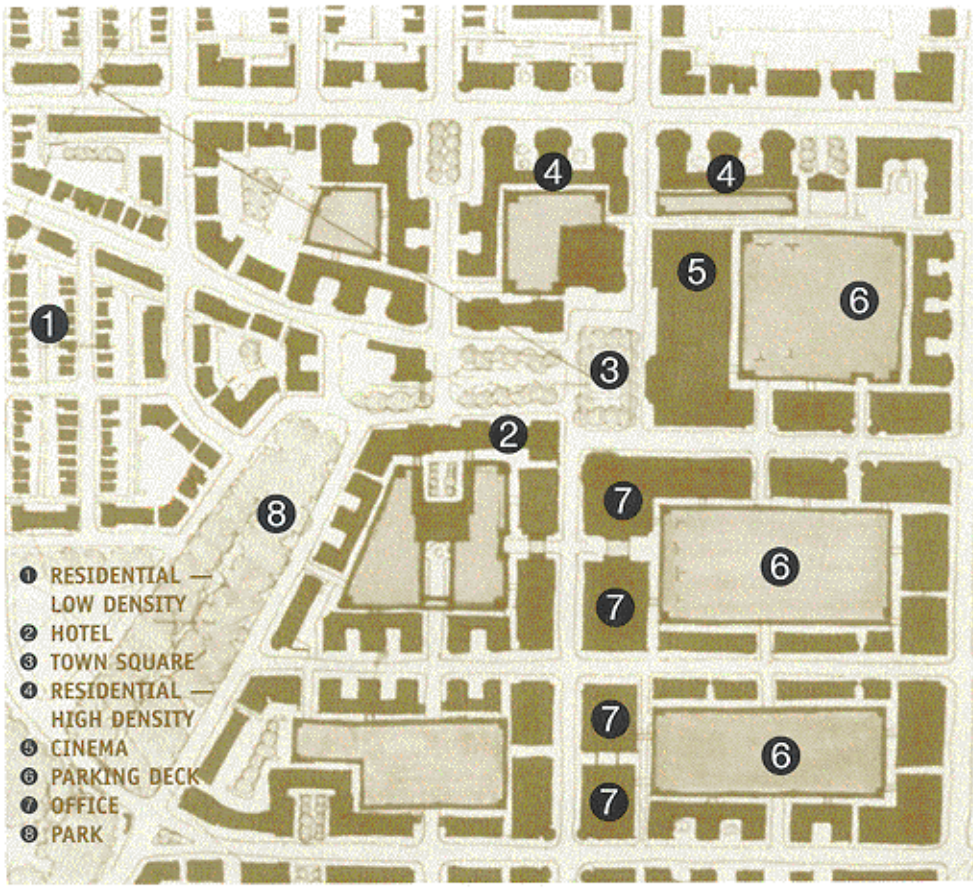
In the single-use scenario, the community lacks a center, with single-use office parks, retail and entertainment, schools, housing and other uses dispersed in large, separate pods. Employment takes up approximately 20 percent of the site. Land use is completely auto-oriented. The employment center is a typical suburban office campus — a collection of individual buildings, surrounded by surface parking and open space, with no pedestrian or bicycle connections between buildings or between buildings and the surrounding uses. Parking is provided in surface lots. There is no formal organization of public space. The road network is very hierarchical, with major generators located on high-capacity arterials or major collector roads, while in the residential subdivisions there is an abundance of loops and cul-de-sacs. There is 25 percent open space.

The core of the single-use scenario depicts an assemblage of office buildings, parking lots and detention facilities with no formal spatial organization and designed exclusively for vehicular circulation. The circulation system consists entirely of major collector roads and private driveways creating a significantly impoverished public realm. This environment effectively excludes all human activities that are not directly related to the office tenant's immediate business.



Left: Typical view of the core of the single-use scenario — an environment where human interaction is reduced to a minimum and only a very narrow range of human needs are satisfied.

Top: The single-use scenario is organized as a series of "pods" or single-use development areas. The overall layout reflects the principles of strict separation of land uses and of complete auto-dependency. Office and retail occupy prominent frontages along major arterials and at interchanges. Manufacturing, warehousing and higher density housing occupy less prominent frontages along arterials. Single-family and civic uses occupy the interior of the site. The circulation and public open space systems do not define a formal physical framework. There are no central places, only frontages. Cul-de-sacs are used whenever possible.

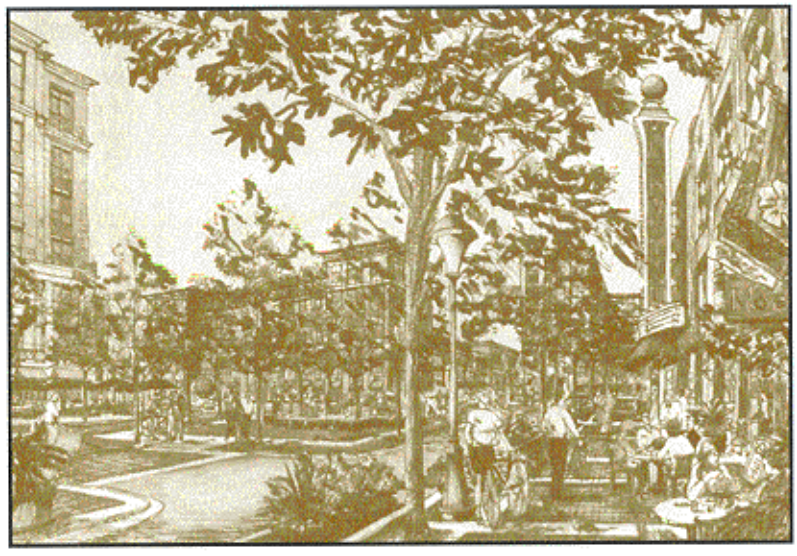


Left: The core of the mixed-use scenario reflects a formal spatial organization driven by the public realm. A five-minute walking distance encompasses a variety of uses, building sizes and activities. A wide range of human needs can be satisfied. Most off-street parking is structured and concealed in the interior of blocks. Public parks and plazas function as focal points for higher intensity uses.

Below: Typical view of the core of the mixed-use scenario — a vibrant pedestrian atmosphere which embraces the community at large and caters to its needs as well as to the office workers.

The Mixed-use Development Scenario

In the mixed-use scenario, the community is comprised of seven neighborhoods, each with its own center, and one of which functions as the primary central place. The overall layout of the community is based on five-minute walking distances. At the core, office buildings are integrated with a variety of other uses — retail, restaurants, services, entertainment, civic and housing to form a vibrant, 24-hour community center. Most parking is provided through mid-block parking structures. The employment center occupies only 12 percent of the site, given the higher densities. Each neighborhood in turn has its own smaller-scale center, with a green, some small-scale office space, some convenience retail, services and higher density housing. Public open space is used as a focal point for organizing each neighborhood as well as a way of linking neighborhoods to each other and to the center. Schools are strategically located to maximize pedestrian access from the neighborhoods. The street network emphasizes connectivity and frames a series of high-quality public spaces, which



connect neighborhoods to each other and to the center. Larger warehousing and distribution facilities are still oriented towards the highway but all other commercial uses are directly integrated into the fabric of the community. There is 35 percent open space.

The mixed-use scenario is organized into seven mixed-use neighborhoods, defined by a five-minute walking distance radius. There is an overall town center, and each neighborhood in turn has its own smaller center. Higher intensity uses — office, retail, multi-family housing, entertainment and others gravitate to these central places, creating vibrant mixed-use environments. Lower intensity uses occupy the interior of each neighborhood. Collector streets link central places with regional arterials. Open space defines neighborhood edges and provides green connections between neighborhoods. This formal spatial organization reflects the primacy of the public realm. Space-intensive manufacturing and warehousing activities are located on the fringes of neighborhoods, with direct highway access. But even these uses are accessible on foot.

1. NEIGHBORHOOD 1
2. NEIGHBORHOOD 2
3. NEIGHBORHOOD 3
4. NEIGHBORHOOD 4
5. NEIGHBORHOOD 5
6. NEIGHBORHOOD 6
7. NEIGHBORHOOD 7
- A. DISTRIBUTION/MANUFACTURING
- B. SCHOOLS
- C. COMMUNITY COLLEGE

Measuring Impacts

The differences between single-use and mixed-use, between auto-oriented and compact development can be striking, both visually and in terms of performance. The *Impact Assessment* prepared by Rutgers University's Center for Urban Policy Research for the 1992 State Plan indicates how focusing development in centers and adhering to more compact forms would benefit the state. Significant savings in terms of land consumption, infrastructure costs, environmental degradation, and other areas are anticipated, relative to a continuation of current trends. Similar types of savings and benefits can be expected to occur on a site-specific basis, given the two alternative development scenarios discussed.

STATE PLAN IMPACT ASSESSMENT, FINDINGS TO 2010

- Savings of $380 million/year to towns/school districts
- Savings of $700 million in road costs
- Savings of $562 million in water and sewer costs
- Savings of 175,000 acres of land from development
- Savings of 42,000 acres of prime farmland
- 80 percent less consumption of environmentally sensitive lands
- 40 percent less water pollution

SOURCE: CENTER FOR URBAN POLICY RESEARCH, 1992 RUTGERS UNIVERSITY

INDICATORS FOR EVALUATING ALTERNATIVE DEVELOPMENT SCENARIOS

To date, site-based impact assessments of alternative development forms have been able to handle only a few variables at a time — such as traffic, or stormwater. A rigorous comparison of the full range of impacts is not found in the literature, no doubt as a result of the enormous complexities of the task. Emerging software providing a spatial dimension to quantitative modeling holds considerable promise. Some of the indicators which should be used to measure critical differences are listed below.

Land Allocation

- Total land consumption
- Percent land dedicated to various uses (housing, retail/services, roads, parking, public open space, private open space, others)

Transportation

- Modal split, i.e., trips by mode of transportation
- VMT — vehicle miles traveled
- Number of trips
- Average trip length and duration

Parking

- Number of spaces
- Parking distribution (surface, curbside, structured)
- Extent of shared parking

Stormwater

- Percent impervious
- Run-off
- Location and size of detention facilities

Infrastructure

- Road length
- Sewer lines
- Water mains

Performance Indicators

- Percent jobs within 10-minute walk to services
- Percent housing units within 10-minute walk to services
- Percent housing units within 10-minute walk to jobs
- Percent housing units within 10-minute walk to schools
- Percent households living and working in community

REINTEGRATING EMPLOYMENT AND COMMUNITY

Single-use development on greenfield sites — creating auto-dependent employment enclaves and separating places of employment from the rest of the community — has been the dominant development form in New Jersey for 50 years. Our current understanding of the impacts of this type of development strongly suggests that it is not sustainable in the long term, and its popularity and success are ultimately expected to fade. A review of mixed-use development projects from around the country suggests that this is already happening outside of New Jersey. Will the next wave of employment centers in New Jersey follow the State Plan's vision of compact, mixed-use development, where employment is effectively integrated into the community?

A number of material difficulties and constraints associated with reintegrating employment and community, and with compact, mixed-use development in general were identified by expert opinion through interviews and the round-table. State government's role in promoting these concepts is viewed by many professionals as critical. Under present conditions, the private market is not seen as likely to deliver this type of development in New Jersey without strong state leadership and tangible state incentives.

Without greater acceptance at the local level, it is feared that the State Plan's vision of mixed-use centers may not take root. This vision, while based on the state's own traditions, is presently viewed as exotic and is poorly understood by many local officials. Aggressive and sustained efforts at education and outreach to local officials, combined with tangible financial and other incentives to participating communities, are seen by many knowledgeable real estate people as critical to achieving this vision.

The educational and marketing efforts also require better descriptions of the concepts of mixed-use centers and their core criteria. Compelling visual and graphic representations are considered essential. A better explanation of how new mixed-use centers, and particularly regional centers can be created from a partially developed patchwork of uses and activities, is also needed. The image of a *de novo*, 1,800-acre new community is daunting in highly urbanized New Jersey, where developable land in appropriate locations at any scale site is increasingly scarce. The mechanics of retrofitting partially developed places into a more coherent whole need to be explained to the development community and local officials. Local leadership under the authority provided by the state's redevelopment statutes can play an important role in this process.

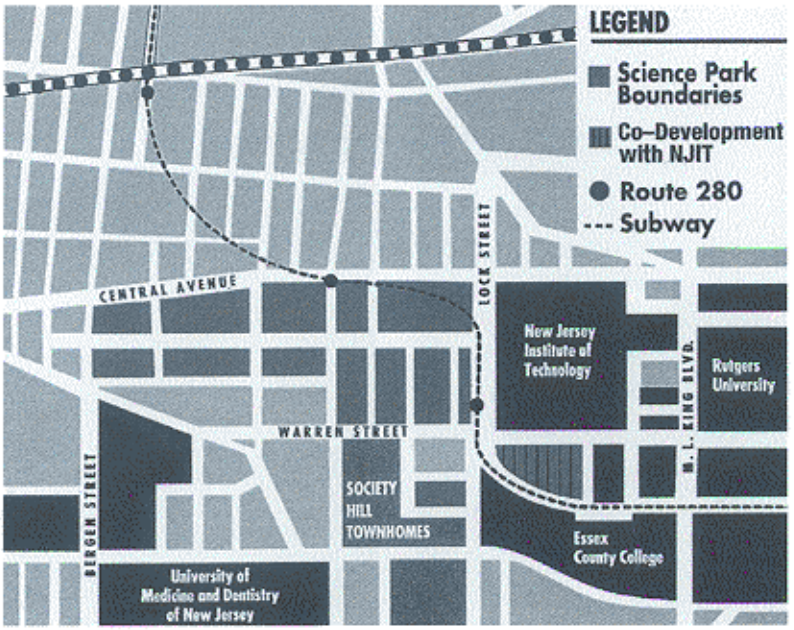
WHY REINTEGRATE EMPLOYMENT AND COMMUNITY?

Reduce
- Land consumption
- Vehicular trips
- Vehicle miles traveled
- Trip length
- Trip time
- Energy consumption
- Water consumption
- Infrastructure costs

Improve
- Air quality
- Water quality

Support
- Transit
- Pedestrians
- Bicycles

Enhance
- Sense of place
- Sense of community
- Informal social interaction
- Civic engagement
- Corporate commitment

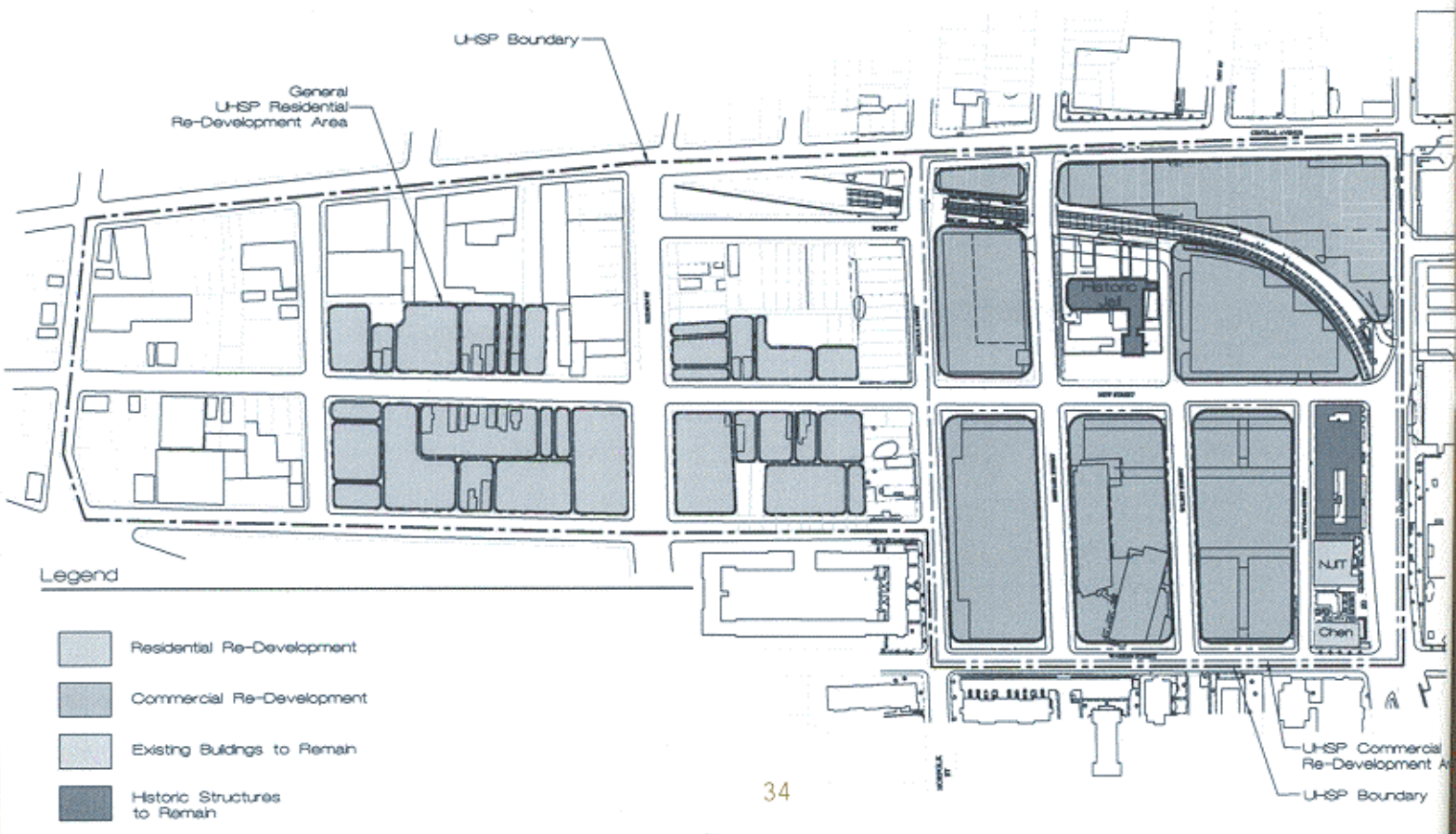


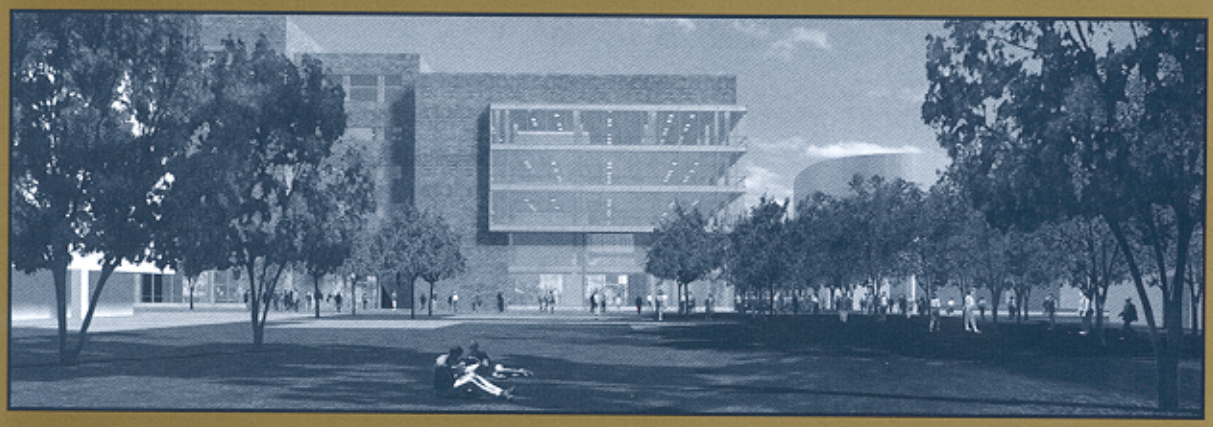
UNIVERSITY HEIGHTS SCIENCE PARK, NEWARK

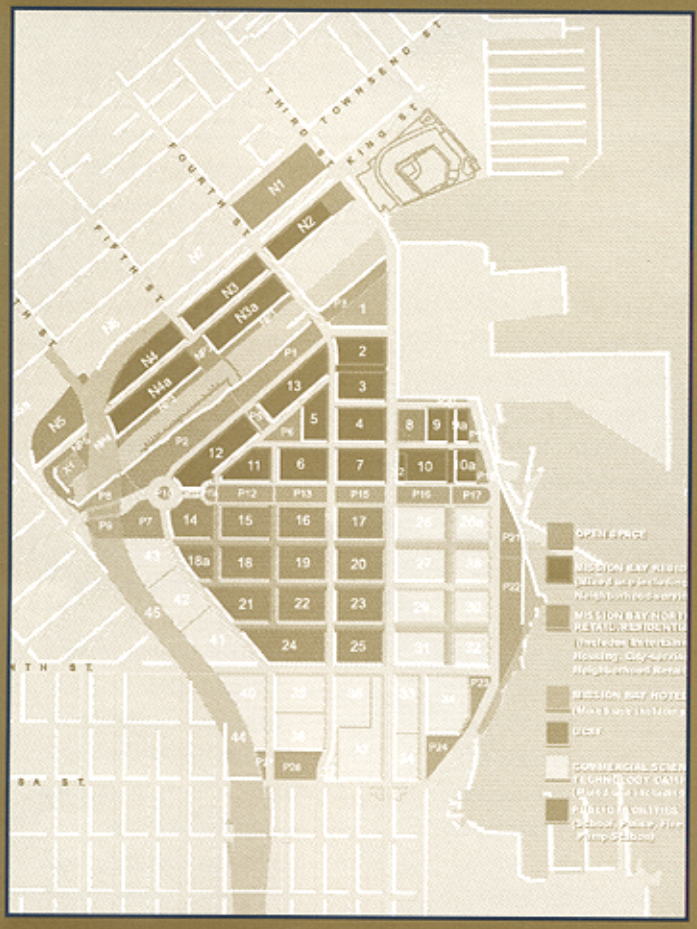
University Heights Science Park in Newark is arguably the boldest and most interesting example currently under development in New Jersey of how to integrate large-scale employment into the broader community.

Science Park is a planned 50-acre mixed-use high-tech employment center, located in Newark's Central Ward. It is adjacent to four educational institutions — the New Jersey Institute of Technology (NJIT), the University of Medicine and Dentistry (UMDNJ), Rutgers University's Newark campus and Essex County College. These institutions, along with the City of Newark, the State of New Jersey and private industry, are the project's primary sponsors.

At build-out, University Heights Science Park will include 1,000,000 square feet of technology laboratories and offices, 75,000 square feet of technology incubator space, up to 20,000 square feet of retail, an 800-student technology high school, 125 units of infill housing and a daycare facility. The Park is served by bus; by two subway stops, which connect it to the Northeast Corridor; and is easily accessible on foot from the adjacent neighborhoods.







MISSION BAY, SAN FRANCISCO

Mission Bay is a planned new mixed-use, high-tech neighborhood in San Francisco that will combine up to 31,000 jobs, primarily in biotechnology industries, with housing and a variety of other uses.

Plans for Mission Bay, located on 303 acres of former railroad yards, call for 5 million square feet of commercial space, including office buildings and commercial lab space, 2.65 million square feet of university buildings, and 6,000 housing units, including a significant affordable component, along with parks and open space.

The new neighborhood is anchored by a 43-acre life-sciences campus, currently under construction, for the University of California at San Francisco.

Of particular interest is the urban-design framework chosen for Mission Bay. Rather than seek to develop the area as a self-contained enclave, the plan fosters a continuation of the city, by extending the urban grid. The block sizes are based on a surveyor's map of the area dating back to 1839. The resulting urban fabric will be eminently walkable, and walking will be encouraged as a preferred and pleasant mode of transportation.

Further contacts with corporate tenants and lenders are needed to better assess their receptivity to the issues of linking employment to community. Notwithstanding possible concerns which large corporate tenants may have regarding closer integration of their facilities into mixed-use environments, it appears that small- and mid-size office tenants may be less likely to share those concerns. Smaller firms may be ready to recognize the considerable advantages of locating in a mixed-use environment. Of particular interest to smaller firms are the cost-savings consequences of locating in a mixed-use environment that gives their work force access to a variety of "quality of life" amenities (restaurants, day care, personal services) which are provided through the marketplace, not through corporate largesse.

From a development industry standpoint, compact, mixed-use environments can be created with only minor departures from currently accepted prototypes and practices. On the other hand there is little reason presently for the development industry to change its current prototypes and practices. Market demand for compact, mixed-use environments is not yet strong enough or focused enough to drive the requisite changes. With a few notable exceptions, corporate leadership in New Jersey has not favored mixed-use environments, and particularly *new*, mixed-use environments. It has instead preferred the conventional office campus model as their location of choice. And the existing permitting and approval framework generally favors low-density, single-use development and penalizes compact, mixed-use development.

This situation can only be overcome through public-private partnerships which level the playing field, redress the balance between the two models of land development and provide a consistent and convincing front of public incentives.

Although there is considerable capacity in existing urbanized areas of New Jersey to absorb additional growth, including employment growth, there is a general consensus that, for a variety of reasons, new development on greenfield sites will continue apace, for the foreseeable future. The State Plan directs new greenfields development into centers, and to areas mapped as suburban planning areas where existing or planned infrastructure will absorb new growth. The question is whether this new development will continue to perpetuate sprawl or begin to create new compact, integrated communities along the lines of the State Plan's centers where employment is truly a part of the community fabric.

It is also felt that the state can demonstrate its commitment to mixed-use centers by playing a more active role in their promotion. The following actions were identified through the interviews and round-table as possible state government initiatives:

- Provide regulatory incentives, by streamlining and simplifying state agency permitting in compact relative to dispersed locations.
- Provide financial incentives to encourage mixed-use development. While tax increment financing is not currently an option in New Jersey, the tax reimbursement program for landfill redevelopment which has been extended to brown-field sites might constitute another approach. Financial incentives for structured parking facilities that capitalize on shared parking conditions is seen as critical.
- Approach and recruit corporations to, as lead tenants, act as "seeds" or "anchors" in new compact mixed-use centers.
- Educate the capital markets on the advantages of compact mixed-use centers.
- Educate the public on the benefits of integrating employment and community, and of mixed-use in general. Target, in particular, local officials. Provide technical assistance on planning and zoning issues to local officials and developers. Assist developers in obtaining local approvals.
- Promote demonstration projects on large state-owned surplus parcels.
- Act to assemble — or facilitate assembly of — land with the right size and location for new centers. Create an easily available catalogue of appropriate sites (both privately held, and those assembled by the state). Act as master developer or provide the framework for a master developer to lead the project.
- Undertake a publicity/outreach campaign to market both the State Plan's overall center concept as well as specific sites that may have been assembled.
- Establish a "Center Ombudsman" at the state level to act as an advocate and facilitator for new centers. This proactive position might include among its responsibilities implementation of some of the ideas listed above, such as assisting developers with permitting, educating local governments and coordinating state financing.

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5 — Aerial view of Newark, 1949 – New Jersey Department of State, State Archives, Fairchild collection

6 — Aerial view of RCA Victor campus, 1948 – New Jersey Department of State, State Archives, Fairchild collection

6 — Aerial view of Bell Labs, Murray Hill campus, 1948 – New Jersey Department of State, State Archives, Fairchild collection. Site plan: Lucent Technologies

7 — Merrill Lynch Scotch Road office park: Wells Appel Land Strategies

8 — Merrill Lynch Scotch Road office park: Wells Appel Land Strategies

9 — Right: Map Division, Library of Congress

9 — Left: Township of West Windsor

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19 — Clockwise, from top left – LMN Architects, LMN Architects, Eckert & Eckert

22 — Top: Calthorpe Associates. Bottom: Duany Plater-Zyberk/Michael Morrissey

23 — Left column: Killinger Alberto, Town Planning. Right column: Calthorpe Associates

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26 to 31 — Torti Gallas-CHK Architects/New Jersey Office of State Planning

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New Jersey Office of State Planning

Department of Community Affairs

PO Box 204

Trenton, New Jersey 08625

(609) 292-7156

http://www.state.nj.us/osp/